

Remarks/Arguments:

Specification

The specification has been amended to correct a clerical error. No new matter has been added.

Pending Claims

Claims 1-16 are pending.

Claims 1-16 have been rejected under 35 U.S.C. § 102(b) as being unpatentable over Borg et al. (US 6,476,864). Applicants respectfully submit that claims 1-16, as amended, are not subject to this rejection for the reasons set forth below.

Borg et al. disclose a pixel column amplifier architecture that creates a reduced noise differential image signal from a pixel sensor array. Abstract. This column amplifier architecture is illustrated in Figure 3A. Figure 3A shows a "block diagram of an active pixel sensor array 280... and its associated circuitry used to control and read out the image that is formed on the array," which includes rows and columns of active pixel sensor sites 10. Column 6, lines 18-22. Column amplifiers 230 are used to read out the image signals from the active pixel sensor sites in their respective columns. Column 6, lines 44-47. Reference column amplifier 240 is coupled to the active pixel sensor sites of a reference column, as shown in Figure 1. Borg et al. disclose that:

This reference column 102 is used to generate one-half of a difference image signal 118, comprised of a first side 120 and a second side 122. The reference column pixels 12 are identical to others in the array except that they use a different reset signal from row decoder 210. Optionally, the reference column pixels 12 may be optically masked to prevent light from striking on them to further reduce noise from being introduced. The reference pixel 12 for a given row, when not being read, is held in a reset state, thus integrating no light. When the reference pixel 12 is selected, the pixel is optionally taken out of reset and the reference column amplifier 240 is driven to a reset pixel level, while all the column amplifiers 230 are driven to a level proportional to the incident light striking that pixel in each column of the selected row. The incident light is integrated over an exposure period to adjust to ambient lighting conditions. During column readout, the reference column amplifier 240 output is always selected to provide one-half (the second side 122) of the difference image signal 118, while the remaining column amplifier 230 outputs are sequentially selected to provide the other one-half (the first side 120) of the difference image signal 118. Column 3, line 67, through column 4, line 21.

Independent claim 1 of the present application, recites a feature that is neither disclosed nor suggested by Borg et al., namely:

...a reference circuit that generates a unique reference voltage associated with each one of the pixels in the group of pixels;...
Emphasis added.

Independent apparatus claims 5 and 10, as amended, include a similar feature:

...a reference circuit that samples a unique reference voltage as each video voltage is read from the video circuits. Emphasis added.

Independent method claim 13, as amended, also includes a similar feature:

...sampling a unique reference voltage as each video voltage is read.
Emphasis added.

As described in paragraph [0017] of the present application, "...reference circuit 14 preferably includes a single reference amplifier associated with all rows of pixels. The reference amplifier provides a unique reference voltage as the video voltages derived from each pixel of a row of pixels is read from the video amplifiers." Figure 3 illustrates the *Ref Sample* and *Ref Sample* timing signals that control the operation of reference circuit 14. As recited in claims 1, 5, 10, and 13, as amended, these timing signals cause a "unique reference voltage" to be generated (or sampled) for each pixel as the associated video signal is read by the associated video amplifier of the video circuits.

In contrast, Borg et al. disclose that "reference column amplifier 240 is driven to a reset pixel level, while all the column amplifiers 230 are driven to a level proportional to the incident light striking that pixel [associated with the column amplifier 230] in each column of the selected row." Column 4, line 11-14. Thus, Borg et al. generates a reference voltage for each row of pixels and that single reference voltage is used for every pixel in that row. Borg et al. does not teach or suggest generating a unique reference voltage for each pixel in the row, as recited in claims 1, 5, 10, and 13, as amended, of the present application.

Therefore, for the reasons set forth above, claims 1, 5, 10, and 13, as amended, are not be subject to rejection under 35 U.S.C. § 102(b) as unpatentable over Borg et al. As claims 2-4 depend from claim 1, claims 6-9 depend from claim 5, claims 11 and 12 depend from claim 10, and claims 14-16 depend from claim 13, these claims are not subject to this rejection as well.

Applicants respectfully request reconsideration and allowance of claims 1-16.

Respectfully submitted,



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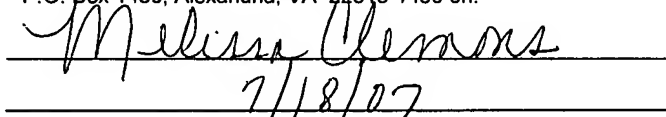
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